

WHAT IS CLAIMED IS:

1. A color conversion method comprising:
 - calculating a range of color distribution of inputted image data to obtain a result as a color range parameter;
 - producing a mapping function to map a color range including the color distribution range represented by the obtained color range parameter in a first color space and conversing the inputted image data by the mapping function,
 - producing a first writing address to write the inputted image data converted by the mapping function into a color conversion table,
 - producing a second writing address which is an inverse function of the first writing address;
 - reading setting data into the color conversion table from a color conversion master database by using of the second writing address;
 - reading a second color space from the color conversion table by using a high-order bit of the first writing address and the setting data; and
 - converting color referring to second color space data and further interpolating the data to transform color, when the corresponding data does not exist.
- 25 2. The color conversion method according to claim 1, wherein the image data is inputted from a scanner.

3. The color conversion method according to
claim 1, wherein the image data is inputted from
a digital camera.

4. The color conversion method according to
5 claim 1, wherein the mapping function which maps
the color range parameter in the first color space
surjectively maps a color space of a mapping element in
a region (hexahedron) having a volume larger than that
of the color space.

10 5. The color conversion method according to
claim 1, wherein the mapping function which maps the
color range parameter in the first color space maps
a gray point in a color space of a mapping element in
a gray axis of a color conversion table address space.

15 6. The color conversion method according to
claim 1, wherein the mapping function which maps the
color range parameter in the first color space maps
individual vertexes of a hexahedron indicating the
color range parameter of a mapping element in the
20 corresponding vertexes of a hexahedron having a larger
volume.

7. The color conversion method according to
claim 1, wherein the mapping function which maps the
color range parameter in the first color space maps
25 individual edge lines of a hexahedron indicating the
color range parameter of a mapping element in a side of
an outermost boundary of a color conversion table

address space.

8. A color conversion apparatus comprising:

an input image color range extracting section
which calculates a color distribution range of inputted
image data to output the result as a color range
parameter;

an address map producing section which produces
a mapping function to map a color range represented by
a first color space including the color distribution
range represented by the color range parameter in
accordance with a predetermined mapping function;

an address map calculating section which converts
the inputted image data in accordance with the mapping
function;

a color conversion table address producing section
which produces a write address into a color conversion
table;

an address inverse map calculating section to
inversely map/convert the write address into the color
conversion table in accordance with an inverse mapping
function which is an inverse function of the mapping
function produced by the address map producing section;

a color conversion master database from which
setting data is read using an inverse map result of
the color conversion table write address supplied from
the address inverse map calculating section as a read
address;

a color conversion table in which the setting data
read and supplied from the color conversion master
database is written beforehand with respect to the
color conversion table write address and from which
5 second color space data is read using a high-order bit
of an address map calculation result supplied from the
address map calculating section as the read address;
and

10 a color conversion section which refers to the
second color space data read from the color conversion
table and which interpolates the data to output a
result.

15 9. The color conversion apparatus according
to claim 8, wherein the image data is inputted from
a scanner.

10. The color conversion apparatus according
to claim 8, wherein the image data is inputted from
a digital camera.

11. The color conversion apparatus according
20 to claim 8, wherein the mapping function which maps
the color range parameter in the first color space
surjectively maps a color space of a mapping element in
a region (hexahedron) having a volume larger than that
of the color space.

25 12. The color conversion apparatus according to
claim 8, wherein the mapping function which maps the
color range parameter in the first color space maps

a gray point in a color space of a mapping element in a gray axis of a color conversion table address space.

13. The color conversion apparatus according to
claim 8, wherein the mapping function which maps the
color range parameter in the first color space maps
individual vertexes of a hexahedron indicating the
color range parameter of a mapping element in the
corresponding vertexes of a hexahedron having a larger
volume.

10 14. The color conversion method according to
claim 8, wherein the mapping function which maps the
color range parameter in the first color space maps
individual edge lines of a hexahedron indicating the
color range parameter of a mapping element in a side
15 of an outermost boundary of a color conversion table
address space.

15. A color conversion apparatus comprising:
input image color range extracting means for
calculating a color distribution range of inputted
image data to output the result as a color range
20 parameter;

address map producing means for producing a
mapping function to surjectively map a color range
including the color distribution range represented by
25 the color range parameter in a first color space;

address map calculating means for converting the
inputted image data in accordance with the mapping

function;

color conversion table address producing means
for producing a write address into a color conversion
table;

5 address inverse map calculating means for
inversely mapping/converting the write address into the
color conversion table in accordance with an inverse
mapping function which is an inverse function of the
mapping function produced by the address map producing
10 means;

a color conversion master database from which
data is read using an inverse map result of the color
conversion table write address supplied from the
address inverse map calculating means as a read
15 address;

a color conversion table in which the data read
and supplied from the color conversion master database
is written beforehand with respect to the color
conversion table write address and from which second
20 color space data is read using a high-order bit of
an address map calculation result supplied from the
address map calculating means as the read address; and

color conversion means for referring to the second
color space data read from the color conversion table
25 and interpolating the data to output a result.

16. The color conversion apparatus according to
claim 15, wherein image data stored in an image memory

for each input object and stored beforehand in the image memory for the color conversion is used as the image data for use in the calculation of the range of the color distribution.

5 17. The color conversion apparatus according to claim 15, wherein the image data for use in the calculation of the range of the color distribution is acquired by pre-scanning of the input object, and the same input object is scanned again for the color
10 conversion.

18. A color conversion method comprising:
converting inputted lattice point RGB data into intermediate data in a predetermined color space based on an ICC profile of RGB;
15 converting the intermediate data into second intermediate data based on the ICC profile of CMYK;
correcting/processing the second intermediate data to prepare a color conversion table; and
referring to color space data read from the
20 prepared color conversion table to directly color-transform the RGB data which is a color conversion object into CMYK data.

19. A color conversion apparatus comprising:
a first color conversion section which converts
25 inputted lattice point RGB data into intermediate data in a predetermined color space based on an ICC profile;
a second color conversion section which converts

the intermediate data converted by the first color conversion section into second intermediate data based on the ICC profile;

5 a correcting/processing section which corrects the second intermediate data produced by the second color conversion section;

 a color conversion table in which a corrected value corrected by the correcting/processing section is held; and

10 a direct color conversion section which refers to color space data read from the color conversion table to convert RGB data which is a color conversion object into CMYK data.